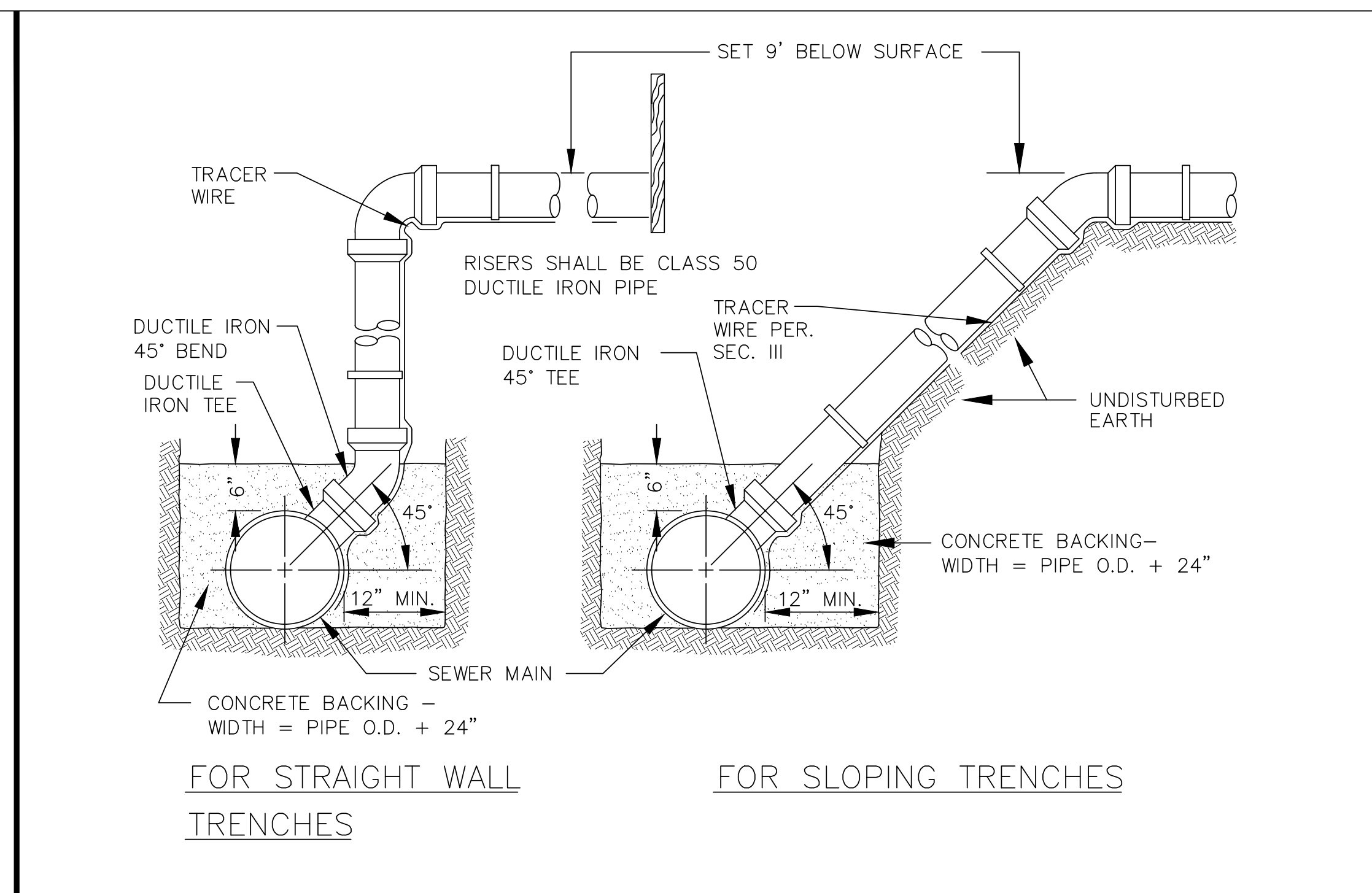
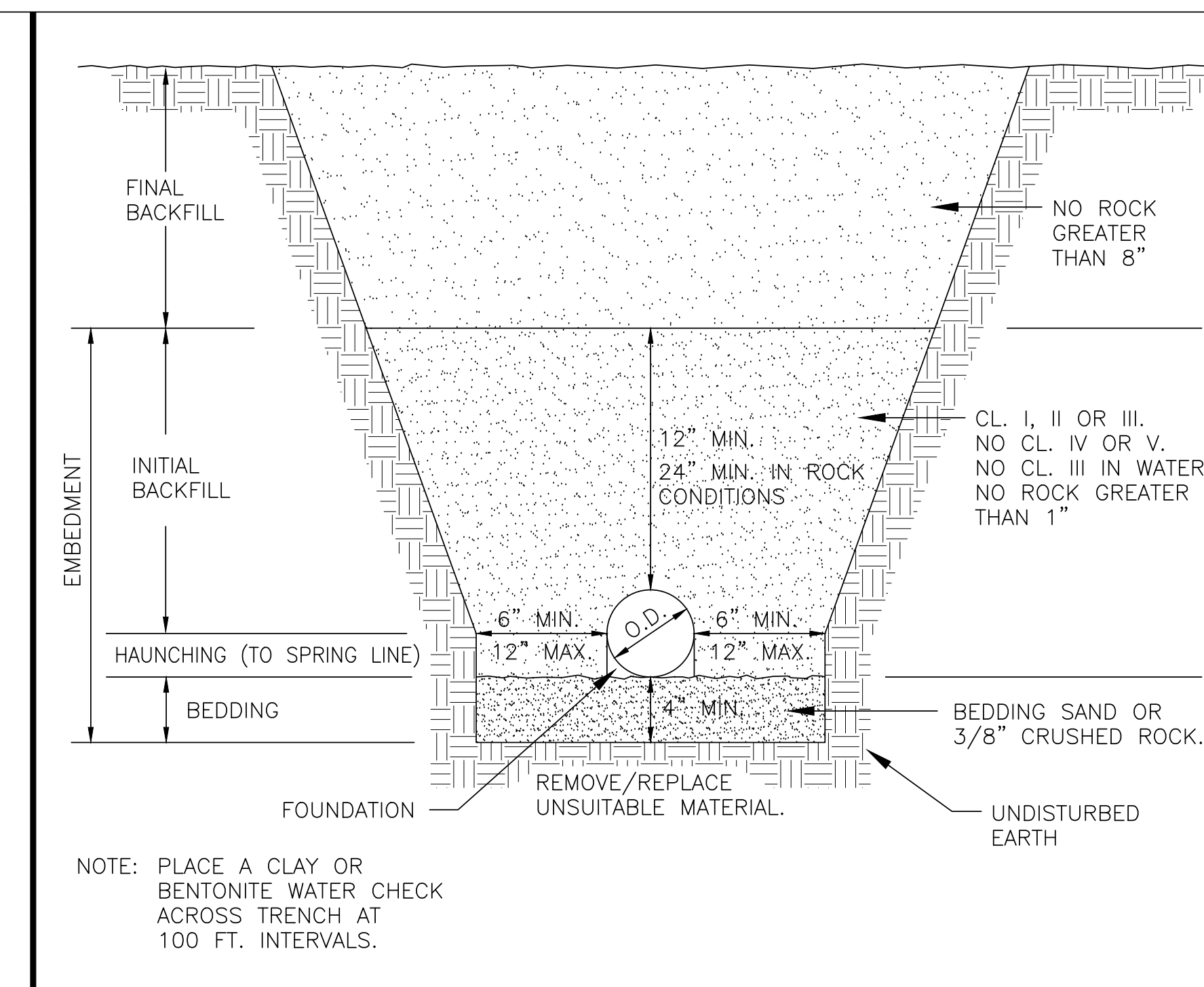


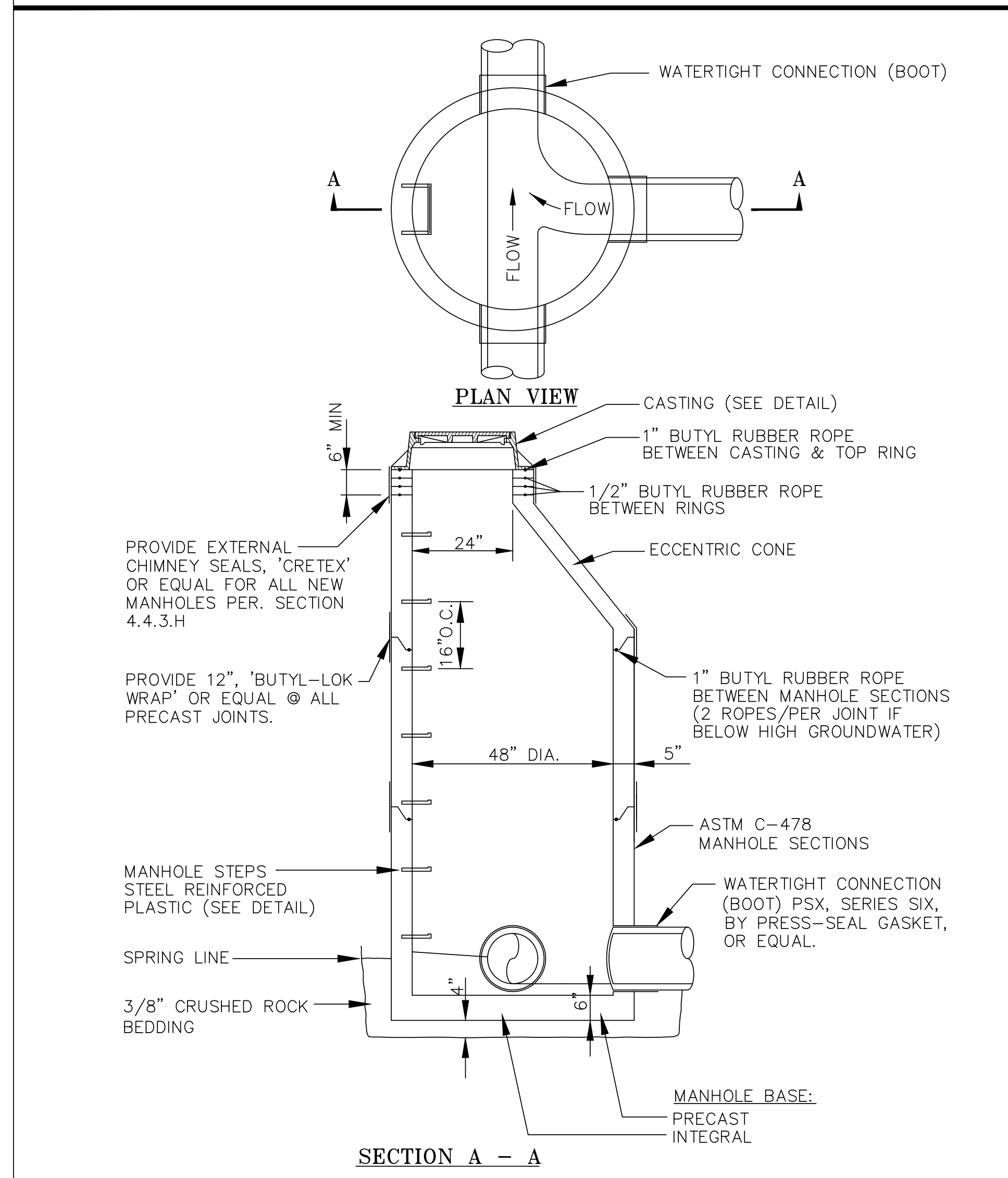
STANDARD FRAME, COVER, & STEP
NO SCALE



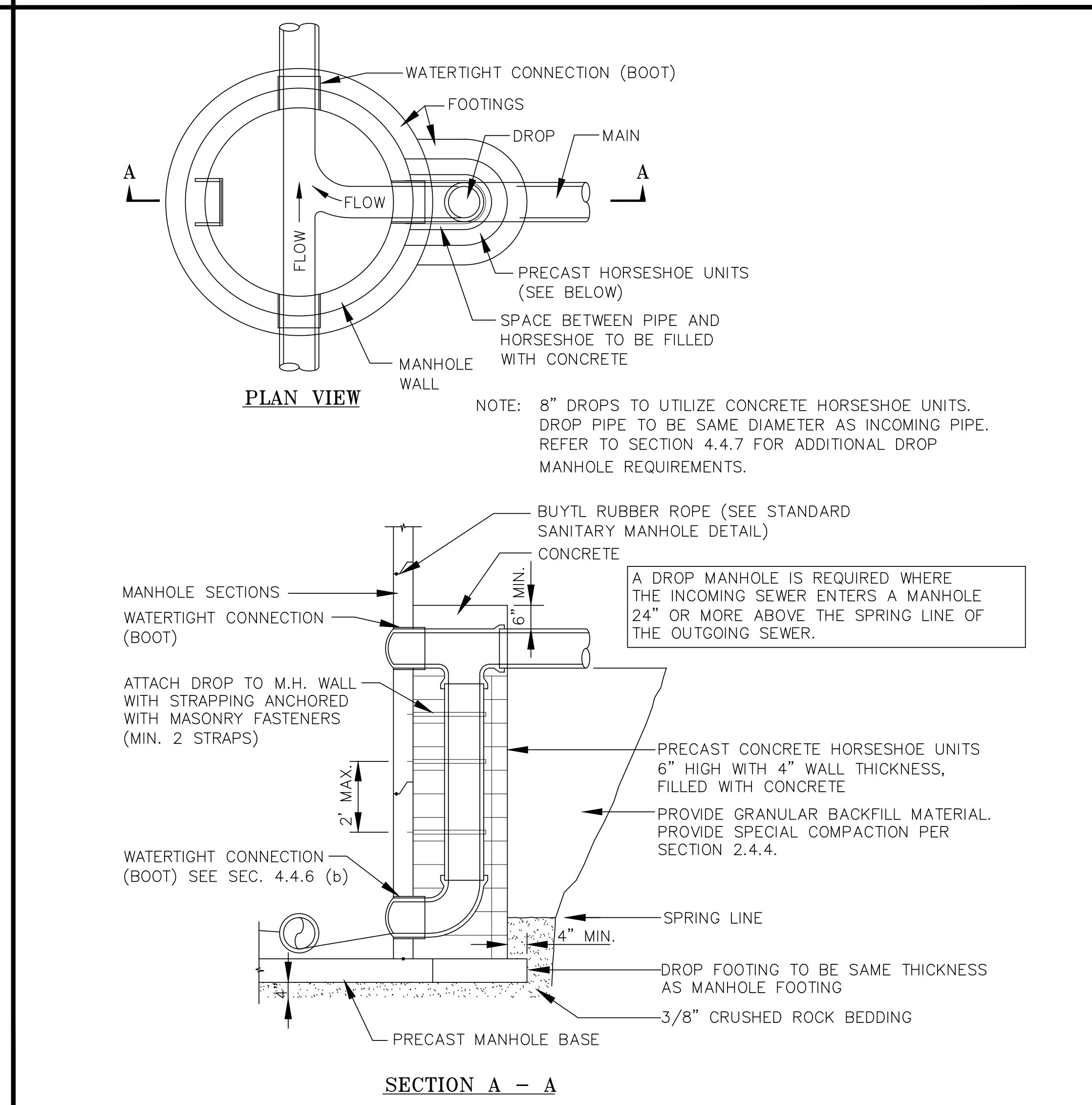
DETAILS OF RISERS FOR HOUSE CONNECTION
NO SCALE



STANDARD PIPE BEDDING DETAIL
NO SCALE



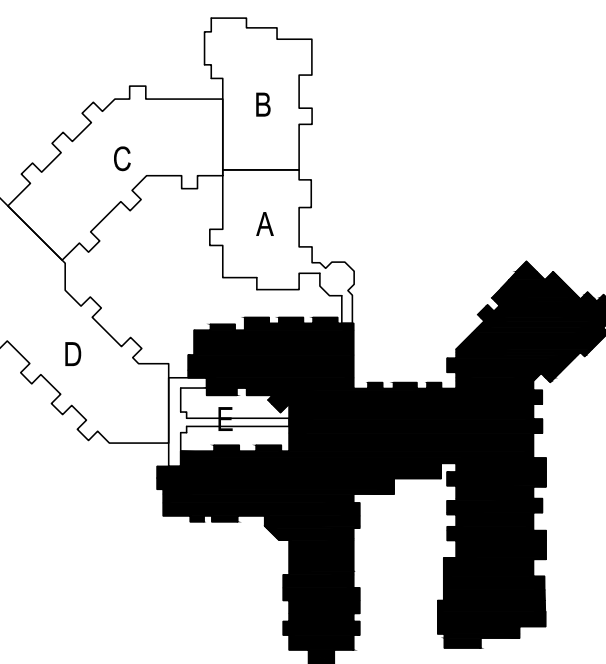
DETAIL OF STANDARD SANITARY MANHOLE
NO SCALE



DETAIL OF DROP MANHOLE
NO SCALE

SOIL CLASSIFICATION CHART					
COARSE-GRAINED SOILS					
GW	Well-graded gravel	Gravels	Clean gravels < 5% fines		
GP	Poorly graded gravel	More than 50% of coarse fraction retained on #4 sieve	Gravel with fines >12% fines		
GM	Silty gravel				
GC	Clayey gravel				
SW	Well-graded sand	Sands	Clean sands < 5% fines		
SP	Poorly graded sand	50% or more of coarse fraction passes #4 sieve	Sand with fines >12% fines		
SM	Silty sand				
SC	Clayey sand				
FINE-GRAINED SOILS					
CL	Lean clay	Silts and Clays	Inorganic		
ML	Silt				
OL	Organic clay/silt	Liquid limit < 50	Organic		
CH	Fat clay				
MH	Elastic silt			Liquid limit > 50	Inorganic
OH	Organic clay/silt				
PT	Peat		Organic		
Soil Classes					
Crushed rock			Class I		
Clean coarse grained	SW, SP, GW, GP	<12% passing #200	Class II		
Coarse grained with fines	GM, GC, SM, SC	>12% passing #200	Class III		
Silty Clay	CL, ML	>30% retained #200	Class III		
Fine grained	CL, ML	<30% retained #200	Class IV		
	MH, CH, CL, CH, PT		Class V		
Use of Soil Classes for Foundation, Embedment and Backfill					
Foundation	4" minimum in rock excavation				
Foundation - no water	Class I, II or III or subcut and use Class I or II				
Foundation - with water	Class I or II or subcut and use Class I or II				
Bedding	4" minimum Bedding Sand (3.24.2) or 3/8" Crushed Rock (3.24.1)				
Embedment - no water	Class I, II or III or replace with Class I, II or III				
Embedment - with water	Class I or II or replace with Class I or II				
Foundation and embedment	No rock > 1", No Class IV or V				
Final Backfill	No rock > 8"				
Embedment includes Bedding, Haunching and Initial Backfill					
Compaction for Foundation, Embedment and Backfill					
Foundation	90% Modified Proctor				
Bedding	90% Modified Proctor				
Haunching	90% Modified Proctor				
Initial Backfill	90% Modified Proctor				
Final Backfill	90% - 95% Modified Proctor				

SOIL CLASSIFICATION CHARTS



Dead End

RESTRAINED SLIP JOINTS
DIP-EBBA IRON MEGALUG SERIES 1700, OR EQUAL
PVC-EBBA IRON MEGALUG SERIES 1500, OR EQUAL

Pipe Size	Restrained Lengths, L (ft.)	
	PVC	DIP
4	23	29
6	33	41
8	43	53
10	52	64
12	62	76

Vertical Offset

RESTRAIN ALL JOINTS BETWEEN FITTINGS

Pipe Size	Restrained Lengths, L (ft.)	
	PVC	DIP
4	10	12
6	14	17
8	18	22
10	22	27
12	26	32

Horizontal Bend

RESTRAINED MECHANICAL JOINTS
DIP-EBBA IRON MEGALUG SERIES 1100, OR EQUAL
PVC-EBBA IRON MEGALUG SERIES 2000, OR EQUAL

Pipe Size	Restrained Lengths, L (ft.)	
	PVC	DIP
6	11	12
8	15	16
10	18	19
12	21	22

Reducer

Pipe Size	Restrained Lengths, L (ft.)	Restrained Lengths, L (ft.)	
		Large	Small
6	4	17	21
8	4	31	38
8	6	18	23
10	6	32	40
10	8	18	22
12	8	33	41
12	10	18	23

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NOTE: LENGTHS L, Lr AND b AS LISTED IN TABLE 1 OR AS SPECIFIED BY DESIGNER.

Pipe Size	Restrained Lengths			
	Run	Branch	PVC	DIP
4	4	4	1	1
6	4	4	1	1
6	6	5	3	4
8	4	4	1	1
8	6	4	2	2
8	8	6	7	9
10	4	4	1	1
10	6	4	1	1
10	8	5	6	7
10	10	7	10	12
12	6	4	1	1
12	8	5	1	1
12	10	7	1	2
12	12	9	7	9

NOTES ABOUT TABLES:
THESE TABLES ARE BASED UPON PRODUCT SOFTWARE DEVELOPED BY EBBA IRON, INC. AND ARE CALCULATED BASED ON THE FOLLOWING ASSUMPTIONS:
1. THE SOIL TYPES ARE SILTY LOAM (ML) OR BETTER. INORGANIC SILTS, FINE SANDS, CLAYS (NATIVE SOILS).
2. SAFETY FACTOR, 1.5:1
3. TRENCH TYPE 4.
4. DEPTH OF BURY, 7 FEET OF COVER.
5. INTERNAL PRESSURE, 150 PSI TEST PRESSURE.
FOR OTHER PIPE SIZES OR CONDITIONS, CONTACT THE ENGINEER FOR RESTRAINED LENGTHS REQUIRED.

STANDARD PIPE BEDDING DETAIL

NO SCALE

SOIL CLASSIFICATION CHART

COARSE-GRAINED SOILS			
		Gravels	
GW	Well-graded gravel	More than 50% of coarse fraction retained on #4 sieve	Clean gravels < 5% fines
GP	Poorly graded gravel		Gravel with fines >12% fines
GM	Silty gravel		
GC	Clayey gravel		
FINE-GRAINED SOILS			
		Silts and Clays	
CL	Lean clay	Liquid limit < 50	Inorganic
ML	Silt		Organic
OL	Organic clay/silt	Liquid limit > 50	Inorganic
CH	Fat clay		
MH	Elastic silt		
OH	Organic clay/silt		
PT	Peat		Organic

Soil Classes

Soil Class	SW, SP, GW, GP	GM, GC, SM, SC	CL, ML	CL, ML	MH, CH, CL, CH, PT
Crushed rock					
Clean coarse grained	<12% passing #200				
Coarse grained with fines	>12% passing #200				
Silty Clay	>30% retained #200				
Fine grained	<30% retained #200				

Use of Soil Classes for Foundation, Embedment and Backfill

Foundation	Embedment and Backfill
Foundation	4" minimum in rock excavation
Foundation - no water	Class I, II or III or subcut and use Class I or II
Foundation - with water	Class I or II or subcut and use Class I or II
Bedding	4" minimum Bedding Sand (3.24.2) or 3/8" Crushed Rock (3.24.1)
Embedment - no water	Class I, II or III or replace with Class I, II or III
Embedment - with water	Class I or II or replace with Class I or II
Foundation and embedment	No rock > 1", No Class IV or V
Final Backfill	No rock > 8"

Compaction for Foundation, Embedment and Backfill

Foundation	Bedding	Haunching	Initial Backfill	Final Backfill
90% Modified Proctor	90% Modified Proctor	90% Modified Proctor	90% Modified Proctor	90% - 95% Modified Proctor

TABLE 1 Minimum Restrained Lengths For Fittings (L)

NO SCALE

POLYETHYLENE PIPE WRAP FOR DIP

NO SCALE

8 MIL LOW DENSITY PER AWWA C-105
OVERLAP
3' (TYP.)
SEAL WITH TAPE (3' INTERVAL)

EXTEND POLY WRAP 3' UP SERVICE CONNECTIONS

COPPER WATER SERVICE CONNECTION

NO SCALE

22" MIN. OFFSET
CORPORATION STOPS SHALL BE EQUAL TO MUELLER H-15008 OR H-15023, COMPLETE WITH NECESSARY COUPLINGS PER SEC. III & VIII
MAINTAIN MINIMUM 7" COVER
CURB STOPS SHALL BE EQUAL TO MUELLER H-10314 OR H-10386, COMPLETE WITH NECESSARY COUPLINGS PER SEC. III & VIII
BACKFILL PER SEC. VIII
8 MIL POLYETHYLENE WRAP
2" X 6" X 8" SOLID CONCRETE BLOCK
TYPE "K" COPPER TUBING

HYDRANT TO WATERMAIN CONNECTION W/TRACER WIRE

NO SCALE

HYDRANT
TRACE WIRE (SEE DETAIL)
TAPE TO HYDRANT BARREL
8 MIL POLYETHYLENE
TRACE WIRE (SEE DETAIL)
VALVE BOX ADAPTOR PER SEC. III
8 MIL POLYETHYLENE WRAP
MINIMUM 6 CUBIC FEET OF APPROVED GRAVEL AROUND HYDRANT DRAIN PER SEC. VIII
6" PRESSURE CL. 350 D.I.P.

NOTES:
1. SECURE ALL JOINTS WITH RETAINER GLANDS PER SEC. III & VIII
2. TRACER WIRE SHALL SURFACE AT ALL HYDRANTS.

